

## Metadata Access to Archival Collections on Malay Cultural Heritage at ATMA: Architecture and Proverbs

SUPYAN HUSSIN  
DING CHOO MING  
KALA KUPPUSAMY

### ABSTRAK

*Rencana ini berupa ulasan mengenai pembinaan kamus digital peribahasa Melayu dan imej digital koleksi N. A. Halim. Sekiranya kamus digital peribahasa itu mengandungi teks, maka pangkalan data koleksi N. A. Halim pula terdiri daripada foto, slaid, peta dan imej pandang yang lain. Pengintegrasian bahan-bahan digital yang memang menjadi sebahagian daripada ilmu pribumi Melayu ini diharap boleh membuatnya dapat dicari dengan mudah dan berkesan di Internet.*

*Kata kunci: Tuan penjajah, dokumentasi, Dunia Melayu, pengajian Dunia Melayu, metadata, pangkalan data, Padat, peribahasa Melayu, pantun baba, karya Jawi, kamus Melayu, koleksi N. A. Halim*

### ABSTRACT

*This paper is a review of the metadata construction of a large archive of Malay proverbs and still images from N. A. Halim's collection. The former are textual while the latter are visual. The digital integration of materials that are rightly considered a part of Malay indigenous knowledge hopes to make it possible to retrieve them on the Internet quickly and effectively.*

*Key words: Colonial masters, documentation, Malay World, Malay World studies, metadata, databases, Padat, Malay proverbs, pantun baba, Jawi works, Malay dictionaries, N. A. Halim's Collection*

### INTRODUCTION

It is commonly assumed that knowledge about the Malay World that we have today is mainly a heritage of the colonial masters, particularly the British and the Dutch. This mistake is understandable since historically, the Dutch and English were the first Westerners to have had first-hand contact with the Malays, beginning in the 16<sup>th</sup> century. Over time, they selected topics that not only interested

them, but also reflected the daily lives and traditional culture of the Malays. Many Dutch and British scholars, for instance, had in fact ventured into Malay settlements in pursuit of first-hand information. Reporting these stories was never easy since transportation then was very inconvenient; moreover cultural differences among different Malay groups from different areas were substantial. Thus, months of labour and research were required before a single story could be satisfactorily completed. The researchers studied Malay traditional lifestyles, cultures and beliefs, and observed the hardships that most farmers and fishermen and hunters had to suffer. The Malays then liked singing, dancing and decorative work, and performed rites, dances, songs and recitals as part of their traditional culture. To the colonial masters, an understanding of local culture, history and thought was a pre-requisite for their administration to function. They needed and desired such knowledge and systematically reported what they learned. These reports, together with books and journals compiled by them, sometimes termed as *orientalists*, offer information about Malay indigenous knowledge and cultural heritage. Among some of the important books are:

1. Nicholas Gervais: *A History of Description of Kingdom of Macassar in East Indies* (1701),
2. Isabella Bird: *The Golden Chersonese* (1883),
3. Frank Swettenham: *An Anthology of Buginess and Makassarese Poetry* (1883),
4. Charles Brooke: *Ten Years in Sarawak* (1866).

One could say that all these works were significant contributions in the sense that the information they contain was not available anywhere else. They gave vivid details about Malay society and culture, focusing on the exotic and *oriental*, the ecological and the geographic, the flora and fauna and the exotic natives and the Malays. The existence of so much documentation of a “high standard” written by so many Westerner writers is undeniable evidence of the tremendous interest they had in the Malay World. Since then, much more information about soils, plants, animals and the people has been compiled. To be fair, some of the colonialists tended to focus on negative things about the Malays and other indigenous peoples. We have therefore to deal with confusing contradictory reports, and to right misunderstandings that may have arisen due to a previous lack of direct contact. Most Malays then were living in relatively remote areas, and were simply ignored. This explains why examples of indigenous knowledge becoming part of general knowledge remain scarce. The dominance of knowledge generated by Western researchers and institutions has been very powerful, making it difficult for alternative knowledge systems articulated by Malaysian scientists to make an impression. Besides, the passive resistance of the target groups to aspects of an incomprehensible process of “modernization” was considered a sign of traditionalism, ignorance and lack of flexibility.

Until recently, the idea most of us had of traditional Malay culture was probably limited to the writings of Dutch and British scholars from the colonial period. These vague and stereotyped images represent something less than the whole truth, just as the impression that Malays once had of the Europeans. We certainly do not wish to possess only colonial perceptions of the Malay World. These were often erroneous depictions and perhaps should not be given too much importance. Given the rich tapestry of cultures, as reflected in the diversity and similarity between different regions in terms of history, traditional crafts and traditional lifestyle, we face a considerable challenge in constructing an integrated access mechanism capable of serving the ever demanding clientele of scholars and researchers. So, what shall and can we do? First, our attitude we hold towards ourselves and towards indigenous knowledge must change. The Malay World must be viewed as a place where abundant indigenous knowledge can be found, and multidisciplinary studies need to be developed, and the following aspects duly considered:

1. The diversity of the Malay World requires good and unbiased local scholars to do it justice.
2. The cultural wealth of the Malay World needs to be studied by competent researchers.
3. Many resources in the Malay World remain hidden as yet, and should be uncovered.
4. The future of Malay World scholarship is better in the Malay World than anywhere else and much can be done with proper resources.
5. The strategic importance of the Malay World will continue to draw tremendous global interest.
6. As the global culture grows, local cultures must not be neglected, but must instead be empowered to expand.
7. If others are wise enough to make use of our materials, we in the Malay World should be wise enough to lead their use.

#### METADATA DATABASES AT ATMA

Old and established libraries in the past enjoyed an unchallenged advantage in providing information and material to researchers. However, nowadays, a sustainable competitive edge is no longer based on collection development only, but also on how the collection can best be managed and exploited by researchers using up-to-date technology. Following the tremendous growth in computational power, and in networking bandwidth and connectivity, and seeing the fast rising number of research institutes making information digitally available through the Internet, ATMA undertook to build and implement a metadata information system for Malay World Studies. Now, metadata is a critical mechanism both in knowledge representation and in data mining of archival

material. It is the cumulative result of digitisation in the capture, compression, manipulation, storage and transmission of digital images. These technological advances have solved many problems in the retrieval of pictorial and visual information. Metadata is also used to refer to descriptive information about WWW and other electronic resources, and is able to provide us with means to discover a resource and with details on how it might be accessed (Turner & Brackbill 1998). We started constructing *PADAT*, our first database, as soon as Shamsul Amri Baharuddin took over the leadership of ATMA as 9<sup>th</sup> director in April 1999. With active support from the top management in UKM, he developed a strategic view for the operation of ATMA and created a clear vision of the extent and scope of change to take place. Given the opportunity to gain ATMA a stronger position in the field, we began to design and develop databases focusing on Malay World studies. Subsequently, one database after another was introduced as part of our effort to broaden and deepen Malay World studies, and establish Malaysia's position in the R & D value chain. Malay World studies is after all multidisciplinary, and it is important to sustain interest among top researchers for the field of study. The quick development of these databases has been inspiring. Being the first Malay World studies database on the Internet, our portal – [www.malaycivilization.com](http://www.malaycivilization.com) – caters to a variety of tastes and connects to *PADAT*, one of the largest collections of single articles. Other databases include *Malay Proverbs*, *Pantun Baba/Nyonya Malaysia*, *Jawi Works*, *Malay Dictionaries* and *N. A. Halim's Collection*. Our timing has apparently been right, and these databases bloom forth in rapid succession like flowers during a wet period. With more databases to be added later on, we can say that the portal is becoming an open window into Malay World studies. We hope to develop more databases that will attract all sorts of researchers, scholars and other interested parties, and therewith attain critical mass at a faster rate than traditional libraries in both developing and advanced countries. These databases are not meant to rival traditional libraries, but are superior in the following important aspects:

1. Increased access to relevant information and material;
2. More efficient use of collections;
3. More effective retrieval and use of relevant information;
4. Increased re-use of existing information;
5. Better targeting for research and development, and for surveillance and investigation;
6. Increased possibility for research in new areas and frontiers;
7. Rapid access to broader decision-making base.

All these expected results should contribute to reduced costs and decision-making time, and contribute to more effective decision-making. This will satisfy the needs of more and more researchers, many of whom are understandably frustrated with the present retrieval systems at libraries.

Databases are a radically new type of information management system, made possible not only by new technology, but also by changes in the expectations of users. To realise the full potential of the technology involved, as many sources as possible must be made accessible through integrated channels. As explained in an earlier paper (Ding 2002b), our new databases are modelled after commercial ones such as UMI, but adjusted to local disciplinary needs. We focus on some subject that is important to our field and that promises good returns. Then, we *repackage* the information digitally. In doing that, we have to address current information retrieval problems and give creative suggestions about the future, as advised by Henshaw et al. (2001) and Healy (1998). Our targets are researchers who are not only critical, but who also wish to have continuous seamless access to information through the Internet. In short, we have to provide information solutions, not just information. Repackaged information delivery can *supply higher quality access* (higher satisfaction) faster and at less cost in the long run, despite the extra repackaging expense. IT amplifies our ability to produce our services. These databases – *PADAT*, *Malay Proverbs* and *N. A. Halim's Collections*, among others – are the culmination of five years of Research & Development, involving some RM2 million in investments in the form of grants from UKM, IRPA and MIMOS. Now R & D in ATMA has more than paid for itself, giving us the requisite experience to design and develop our own databases and help to position ATMA more strategically. Our vision is to create a research environment where the researcher does not need to leave his office. S/he can wander through each database and be inspired by another age and culture, and be staggered by the diversity and depth of content. Our materials will span Malaysia, Singapore, Brunei, Indonesia, Pattani and Campa.

These conscious efforts by ATMA to propel research in Malay World studies are comparable to those undertaken by other full-fledged research institutes such as Koninklijk Instituut voor Taal-, Land en Volkenkunde, KITLV, in Leiden; the School of Oriental and African Studies, SOAS, in London; Institute of Southeast Asian Studies, ISEAS, in Singapore and Center for Southeast Asian Studies, CSEAS in Kyoto (Ding & Supyan 2000 & 2003), to mention a few. Our portal will also help gain ATMA the reputation of being a research centre offering global users easy access to important materials in digital form. Readers from all parts of the world can search, browse, download and, on approval, print selected material individually or as a whole collection.

#### THE FIRST WEB-BASED DICTIONARY ON MALAY PROVERBS

Created in mid-2000, this database contains 21,303 Malay proverbs which fall readily into such main categories as *peribahasa* (normally cast as a complete sentence), *simpulan bahasa* (usually with two words), *bidalan* (which take the

form of abstract statements), *pepatah* (comprising traditional sayings from folklore), *perbilang* (making use of specific observations from everyday experience) and *perumpamaan* (otherwise termed metaphorical phrases). Every *peribahasa*, *simpulan bahasa*, *bidalan*, *pepatah* and *perumpama* is rooted in an individual's life experience, perspective and understanding of a problem, and includes a reaction that may benefit members of the community.

This web dictionary was compiled from more than 20 printed dictionaries of Malay proverbs published between the 1960s to the 1990s. This means that most of them are still in current use. The breadth of the coverage can be gauged from their astonishing variety spanning many areas: interpersonal/social planning, decision making, problem solving, resource utilisation, work, education, health, leisure and recreation, self-development, civic consciousness, wisdom, knowledge and experience and other cultural aspects. This allows us to see the long thread of Malay culture and to have a deeper and broader understanding of issues encountered by the Malays and of how they responded to changes. The identification of constructs indigenous to the Malays is an important step towards the development and validation of eco-culturally valid measures taken among the Malays. In combining them now in a digital dictionary accessible on the Internet, we make available a varied set of perspectives. This openness can provide grounds for dialogue among Malaysians of different ethnic, religious and cultural backgrounds, and new space for discussions between Malaysians and scholars from outside the Malay World. This dictionary is intended first and foremost as a practical reference guide, and their publication on the Internet will hopefully make them generally and globally popular.

The most apparent advantage that this digital dictionary has over printed ones is the categorising of all related proverbs under a specific subject. This combination of alphabetical and thematic presentations is that normally favoured by the general reader. All entries can be readily tracked down through meaning as well as subject categories, with the help of the most significant words one can think of. In other words, this user-friendly dictionary dissolves many of the traditional problems encountered when searching in printed dictionaries. Hopefully, this dictionary will be especially useful to students. Access to the various categories is heavily dependent on the user's knowledge about the relevant *peribahasa*, *simpulan bahasa*, *bidalan*, *pepatah* or *perumpamaan*.

#### N. A. HALIM'S COLLECTION

ATMA started work on a database for N. A. Halim's collection in mid-2002 with the eventual aim of creating a portal, [www.malaycivilization.com](http://www.malaycivilization.com). This was made possible by a research grant of RM504,760.00 from the Ministry of Science, Technology and Environment, under the Demonstrator Application Grant Scheme (DAGS) through MIMOS, NITC. This project, together with other databases al-

ready accessible at <http://www.atma.ukm.my>, and many others still under construction, will take ATMA one step forward in the studies of the Malay World.

For this project, ATMA digitised 17,261 slides, photos, plans, drawings and sketches of Malay houses, palaces and other types of buildings taken by the late N. A. Halim from the early 1950s to the late 1990s. While ATMA's technology partner, Paragon Automation, undertook the digitisation in conformity with Z39.50 standards, the physical and content descriptions were provided by ATMA's research team. The latter entailed efforts to reveal what is unique in each of the photos, slides and drawings, and to make them more informative and valuable, despite the fact that each slide, drawing or plan appears quite self-explanatory. Each item thus becomes a separate entity, with a description that establishes its identity and differentiates it from others. This is necessary since an architectural construction, for instance, may be an example of an architect's work or it may be an example of a type of construction, identifiable in time and place. To ensure accessibility to each item, either individually or as part of a group, searchable elements are provided, including accession number, title, date of creation (*if available*), physical and subject description, additional notes and links (*if feasible*).

This collection of mainly non-printed materials was donated by the late N. A. Halim on 11<sup>st</sup> February 1992 to PATMA to encourage scholars to do research on various aspects of Malay architecture. We pay tribute to N. A. Halim, who had devoted a large part of his lifetime to documenting houses, mosques, moats and palaces throughout the Malay World. His beloved photographs and slides come with an accompanying wish to create awareness among Malaysians about the rich heritage of Malay architecture, which is indeed an intrinsic part of Malay culture. Without his indefatigable effort, unflagging patience in recording and documenting his works, we would not now be in possession of photographs, slides, plans and drawings that testify to the diversity of Malay culture. When he had them kept at home, the collection must have given him great satisfaction, both intellectually and emotionally. He treasured the photographs and slides so much that he painstakingly arranged, labelled and mounted some of them for easy reference and preservation. Before his demise on 25<sup>nd</sup> October 1999, he had extracted information from some of these brilliant photographs and slides and used them as illustrations and examples in his numerous books and articles. This was also evidence of his great ability to create and re-invent stories. However, the true value of these items has yet to be fully exploited. Together, they can indeed be considered the finest collection of recent photographs and slides on Malay architecture. He personally told us that he had rejected many offers from *National Geographic* (Washington, DC) to acquire the collection because he always wanted his collection to be intact and accessible to him for occasional usage. This may also explain the immense interest he had amassed for his works, and he himself was a renowned cultural activist.

The greatest strength of the collection lies in its diversity of the subjects covered: houses, palaces, tombs, boats, moats, household utensils and many

others. The size, character and extent of the collection do not only show the great enthusiasm N. A. Halim had for local history and culture, they also make it valuable and unique. In this large and rich collection, one can find something on almost anything on Malay architecture in particular and on Malay institutions, history, culture and society in general. From the point of view of architects, engineers, building contractors, interior designers or local historians, the photographs and slides on Malay architecture are truly valuable for the restoration and re-modelling of buildings. They can corroborate or disprove both written and verbal sources, stimulating the memory of many. A picture is indeed worth a thousand words.

Besides the big structure, such as the Malay stilt-houses with countless windows, holed carvings and slatted panels on walls, and high thatch or clay-tile roofs, it is also a rare gift to be able to glimpse weaving, careful composition and graphically designed *kelarai* used as walls in Malay traditional houses, artwork on *keris* in different shapes, a recording of a wedding ceremony, *Mak Yong*'s performance from the East Coast, contrast of light and shadow uniquely captured, images of the beauty and purity of mangrove swamps and plant life, pictures of old bridges, exquisite ornaments, children at play. Architecturally, a typical Malay house of timber has at least one raised verandah (*serambi*) attached to the house for work and relaxation, and where visitors can be entertained, without disturbing the privacy in the house, which is in turn almost always divided into two parts: *rumah ibu*, the main structure of the house, and the simpler structure kitchen annex, called *rumah dapur*. The building of a traditional Malay house is elaborate and detailed. Religion plays a central role since it is considered crucial to prepare, cleanse and bless the new site and house structure in order to ensure the future well-being of the occupants. While Peninsular Malays have single extended family houses, many of their Borneo cousins build long-houses that host many families, with a common veranda all along the front. In Malaccan houses, the staircase is always beautifully moulded and colourfully tiled. In the East Coast, many houses have distinctive carved gable-end roof boards similar to those in Thailand and Cambodia.

The inhabitants of the Malay World had traditionally built highly developed dwellings whose forms suited their lifestyle and the local habitat. The materials they worked with were always replenishable ones. Traditional roofs could always drain off rain water very quickly. They came in to broad categories, either as *bumbung panjang*, which were long roofs with open gable ends, or *limas*, which were pyramidal variations. Both covered almost every conceivable design, with variations peculiar to different communities. More importantly, the Minangkabau house from Negri Sembilan, for example, had elegant and distinctive upward curve roofs, blending harmoniously with the surrounding environment, and is a draw for tourists and lovers of Malay architecture. Before nails came along, logs and planks were fitted into each other with the help of pre-cut holes and grooves, making them early versions of "pre-fabricated houses".



With no nails to pull out, a timber house could be easily dismantled piece by piece and re-assembled in a new location. Many ornamented traditional houses and royal palaces in the compound of Terengganu State Museum in Kuala Terengganu and the National Museum in Kuala Lumpur were moved there from elsewhere. It was also common for small and relatively light houses to be moved to new spots not too far away, through *gotong-royong*, a form of neighbourly good-will practised in Malay *kampungs*. In Sarawak and Sabah, rattan ropes were used to tie bamboo pieces together to make floors and walls. All these phenomena from the not too distant past can now be seen and enjoyed in N. A. Halim's collection by anyone with access to the Internet. This collection is organized under broad subject categories and numerous sub-categories. Access to it can be done through free-text searches within the available brief descriptions placed beside every title. These materials are visual ones and are a welcome departure for the textuality of our other databases.

Believing that his collection of indigenous material would strengthen Malay studies, the late N. A. Halim donated a major part of his personal collection, comprising mostly non-printed materials, to PATMA on 11 February 1992. With this donation, PATMA suddenly came into possession of the most important collection of depictions of Malay architecture. For the presentation ceremony, a catalogue, *Katalog N. A. Halim*, was specially prepared. Since then, this collection has found a new home, and now, we at ATMA have digitized, re-organized and repackaged it, not only to ensure that a prized collection will be handed down in digital form before deterioration sets in, but also to make sure that it will become more valuable when fully accessible via the Internet. With digitization, we not only do not have to worry about the fragility of the material, the wear-and-tear of use, as well as previously unavoidable problems relating to staffing, space and equipment, we are able to integrate these digital images with those from printed-media to allow *one-stop-access* through our portal, [www.malaycivilization.com](http://www.malaycivilization.com). Digitizing this collection is yet another important ATMA project to make information and materials on Malay World Studies easily accessible.

ATMA is greatly indebted to the family of the late N. A. Halim for allowing this collection to be digitized and made accessible electronically. With its availability via the Internet, historians, researchers, students, architects, media and publishers all over the world will be able for the first time to gain access to a unique Malay cultural heritage. The value of this collection lies not merely in its splendid account of the historical and geographical development of Malay architecture as described earlier, but also in the light it sheds on other aspects of Malay history, anthropology, sociology, culture and society. As the late N. A. Halim very strongly believed, this collection will stimulate research about the Malay World, and may lead to more post-graduate theses on Malay architecture and other related studies being written locally and elsewhere. We are also hopeful that more books and journal articles on Malay architecture and other

related areas will be stimulated by the collection. The cumulative goals of our project [www.malaycization.com](http://www.malaycization.com). are:

1. To empower research on Malay cultural heritage;
2. To enhance Malaysian intellectual presence on the information highway;
3. To foster fondness for indigenous culture among Malaysians;
4. To promote ATMA as a full-fledged research institute on Malay World Studies.

## CONCLUSION

In his book, *Malay Society in the Late 19<sup>th</sup> Century*, J. M. Gullick (1987) noted that there was a Malay World in which a sense of Malayness offered a cultural unity despite the absence of political unity. Of course, the feudal Malays then, even within Malaya, were not homogenous, but parochial, antagonistic and fractious. This Malay World historically embraces what are now Malaysia, Singapore, Indonesia, Brunei, the Southern Philippines and Pattani (in South Thailand). In this world, a number of separate communities or states shared a common way of life, language, religion, agricultural economy and political culture (to the extent that a Malay *raja* – the structure of *kerajaan* – was indispensable). But, the term *Malay World* used at ATMA is both broader and looser at the same time, going beyond the Malaysian constitutional definition of the Malay as a person who speaks the Malay language, practises the religion of Islam and habitually dresses in a Malay fashion. When we think about the history and identity of Malays on the Malay Peninsular, for example, we do not start with the capture of Malacca by the Portuguese and Dutch in the 16<sup>th</sup> century, or the occupation of Malaya by the British or Japanese in the 18<sup>th</sup> and 19<sup>th</sup> centuries. Instead, we consider the continuous activity of the Malays in adapting to and interacting with Islamic, Indian, Chinese, Japanese, British and other Western influences over a period of two thousand years. Adaptation and interaction have become the core processes that Malays had to undergo, objectively and subjectively, externally and internally. This long process makes for an intriguing study of how such a balance could be found in the past between adaptation to “foreign influences” and identification with indigenous culture, and how this can aid us today and in the future. Equally interesting is whether the Malays can combine aspects of Islamic and Western cultures and yet maintain autonomy.

The Malays had undergone wave after wave of cultural renaissance, through periods of turbulent changes, adapting to and interacting with Islamic, Indian, Chinese, Japanese, British and Western cultures. ATMA as a research institute on Malay World Studies has realised that everything possible should be done to preserve Malay cultural expressions. An increasing number of young Malay

intellectuals are now seeking their cultural roots in *peribahasa*, architecture, dancing, singing and many other fields. They have gone to various Malay villages to do fieldwork, teach their mother tongue, trace the migration and the origins of the Malay people and their language, reconstruct clan histories, collect myths and legends, and study traditional music and dance. All these materials will one day be available via ATMA's portal. Integrating them is tantamount to the opening of a lifeline for the transmission of Malay culture to the next generation, and will hopefully correct the inherited general perception of the Malays as backward and ignorant. We believe that as global culture grows, local culture must not be neglected, but instead encouraged to grow into new areas. This is vital to Malaysia since the Malays are the majority, and thus constitute the central part of the nation's modernity.

It is heartening to know that this portal on Malay World Studies has been founded at ATMA in Bangi, right in the heart of the Malay World, and will be very attractive to scholars and researchers from elsewhere. All our databases are the results of efforts to integrate Malay indigenous information with Western technology. Developing these databases has in a way also helped the Malay World preserve local knowledge, and has opened up new space for dialogue. They also symbolise both ATMA turning into a global information provider and Malaysia's changes and progress over the past two decades. The Malay World studies portal is a world of its own, offering scholars and researchers a seamless nexus of research materials that were once scattered. ATMA is now a powerhouse of Malay World studies located *in* the Malay World. Hopefully, *www.malaycivilization.com* will not just be another landmark in an ever-changing world of databases, but will instead be the pinnacle in ATMA's continuing growth, and underscore the institute's commitment to Malay World studies.

#### ACKNOWLEDGEMENT

This is the original paper presented at "Conference on Shared Histories, Communities and Cultural Heritage in Southeast Asia's Western Littoral", organized by Penang Heritage Trust, sponsored by SEAREP, on 30 July – 3 August 2003 in Penang.

#### REFERENCES

- Bekaert, Jeroan et al. 2002. Metadata-based Access to Multimedia Architectural and Historical Archive Collections: a Review. *Aslib Proceedings* 54(6): 362-371.
- Campbell, Jerry. 1995. Copyright, Public Policy and Digital Libraries: Searching for First Principles. In *Copyright, public policy and scholarly communities*. Edited by Michael Mathews and Patricia Brenann. Washington, D.C.: Association of Research Libraries.
- Detrie, Jean-Pierre & Ramanantosa, Bernard. 1986. Diversification – the Key Factors to Success. *Long Range Planning* 19(1): 31-37.

- Ding Choo Ming. 2000. Access to Digital Information: Some Breakthroughs and Obstacles. *Journal of Librarianship and Information Science* 32(1): 26-32.
- \_\_\_\_\_. 2002a. Indexing In Malay World Studies Data-Base: Some Critical Roles of Resource Centers in the Context of Knowledge Work and knowledge worker. Paper presented at *Seminar at UNIMARA*, Shah Alam, September.
- \_\_\_\_\_. 2002b. Access to Materials in and on Malay Studies from Leiden to Bangi: a Model of Information Repackaging on Information Superhighway. Paper presented at *ATMA-KITLV Colloquium: Dutch Scholarship and the Malay World: a critical assessment*, at UKM, 20-22 November.
- \_\_\_\_\_. 2002c. Accessing the Malay World. *SEAREP Bulletin* 7/01: 19-21.
- \_\_\_\_\_. 2002d. The Pantun Database of the Malaysian Baba. *SEAREP Bulletin* 7/02: 24-31.
- \_\_\_\_\_. 2003. The Malay World Portal [www.malaycivilization.com](http://www.malaycivilization.com). *SENADA: Berita Universiti Kebangsaan Malaysia* 252: 10-11.
- \_\_\_\_\_. & Arba'eyah Abdul Rahman. 2002. Daripada Kamus Peribahasa Melayu Digital ATMA Kepada Perkamusan Bahasa Berkomputer. *Dewan Bahasa* 2(7): 48-59.
- \_\_\_\_\_. & Supyan Hussin & Choo Wou Onn. 2002. Pembinaan Pangkalan Data di ATMA: Tapak Kecil Dalam Langkah Besar Membaiki Aliran Maklumat Sehala Dari Barat ke Timur. Paper presented at *Seminar Kebangsaan Bahasa dan Pemikiran Melayu, Akademi Pengajian Melayu*, Universiti Malaya, 18-19 June.
- \_\_\_\_\_. & Supyan Hussin. 2000. Preservation of Culture and Knowledge Through Technology: the Experience of UKM. Paper presented at *UKM-UC Seminar on Technology in Development*, 25<sup>th</sup> 1-3 January at UKM, Bangi.
- \_\_\_\_\_. 2003. Enhancing and Diversifying ATMA's Databases to Ensure Their Sustainability in the Digital Age. Paper presented at *3<sup>rd</sup> UKM-UC International Conference on Societies for a Sustainable Future*. 14-15 April at University of Canberra, Australia.
- Drabenstott, K. 1994. *Analytical Review of the Library of the Future*. Washington, D.C.: Council of Library Resources.
- Getz, Malcolm. 1997. Evaluating Digital Strategies for Storing and Retrieving Scholarly Information. *Journal of Library Administration* 24(4): 81-89.
- Gullick, J. M. 1987. *Malay State in the Late 19<sup>th</sup> Century*. Singapore: Singapore Oxford University Press.
- Healy, S. A. 1998. Science, Technology and Future Sustainability. *Futures* 30(1): 23-42.
- Henshaw, Robin & Valauskas, Edward J. 2001. Metadata as a Catalyst: Experiments with Metadata and Search Engines in the Internet Journal: First Monday. *Libri* 21: 86-101.
- Mathews, Linda, M. 1998. The Collection Management Perspective. *Collection Management* 22(3-4): 193-197.
- McMullen, B. E., Masullo, M.J. 2002. IBM Corporation, & Postlethwaite, B. 1999. *Digital Libraries: Potential and Risks*. Retrieved from <http://www.educause.edu/ir/library/html/edu9948/edu9948.html> on 27 November.
- Ogburn, W. F. 1950. *Social Change with Respect to Culture and Original Nature*. New York: Viking.
- Shamsul Amri Baharuddin, Ding Choo Ming, Supyan Hussin, Afendi Hamat 2001. A Retrieval System for the Database on Malay World Studies. Paper presented at

*National Conference on Research and Development at Higher Institutions of Learning*, 25-26 October at PWTC, Kuala Lumpur.

\_\_\_\_\_, Rumaizah Mohamad & Haslindawati Hamzah. 2002. Pengajian Alam Melayu di Pentas Global: Teknologi Maklumat dan Penstrukturan Ilmu di ATMA, UKM. Paper presented at *Seminar Kebangsaan Bahasa dan Pemikiran Melayu*, Akademi Pengajian Melayu, Universiti Malaya, 18-19 June.

\_\_\_\_\_ & Supyan Hussin. 2003. Teori Pisang: Kekeluargaan, Emosi dan Hubungan Sosial Manusia Melayu. *Persidangan Antarabangsa Pengajian Melayu, bertemakan Emosi Melayu*, anjuran Akademi Pengajian Melayu, Universiti Malaya 11-12 Julai.

Supyan Hussin, Ding Choo Ming, Afendi Hamat, Kamariah Abu Samah & Hazrul A. Halim Nasir. 2002. Development of a Database on Malay Studies at ATMA-UKM to Enhance Information Sharing and Preservation. *IRPA Report* No: 04-02-02-0040. ATMA-UKM.

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, Arbai'eyah Abdul Rahman. 2002a. Sistem Capaian untuk Kamus Peribahasa Melayu Digital Pertama. Paper presented at *Seminar Kebangsaan dan Pemikiran Melayu: Kecemerlangan Melayu dalam Era Teknologi Maklumat dan Komunikasi*, 18-19 June, Akademi Pengajian Melayu, Universiti Malaya.

Turner, R. K. (ed.). 1993. *Sustainable Environmental Economics and Management: Principles and Practice*. London: Belhaven Press.

Turner, T. P. & Brackbill, L. 1998. Rising to the Top: Evaluating the Use of HTML META Tag to Improve Retrieval of World Wide Web Documents Through Internet Search Engines. *Library Recourses & Technical Services* 42(4): 258-271.

Wilson III, Earnest J. 1998. Inventing the Global Information Future. *Futures* 30(1): 23-42.

Sector, Glen M. 1997. Fair Use in Pay-Per-Use World. *Library Acquisitions, Practice & Theory* 21(1): 53-59.

Waren, D. Michael & Cashman, Kristin. 1988. *Indigenous Knowledge for Sustainable Agriculture and Rural Development*. London: International Institute for Environment and Development. (*Gatekeeper Series* No. SA 10).

Supyan Hussin  
Felo Penyelidik Kanan  
Institut Alam dan Tamadun Melayu  
Universiti Kebangsaan Malaysia  
43600 UKM Bangi  
Selangor Darul Ehsan  
e-mail: supyan@pkrisc.cc.ukm.my

Ding Choo Ming  
Felo Penyelidik Kanan  
Institut Alam dan Tamadun Melayu  
Universiti Kebangsaan Malaysia  
43600 UKM Bangi  
Selangor Darul Ehsan  
e-mail: chooming@pkrisc.cc.ukm.my

Kala Kuppusamy  
I-linksoft Solutions Sdn. Bhd.  
Suite 12.02A, 12<sup>th</sup> Floor  
Menara Choy Fook On  
18, Jalan Yong Sock Lin  
46050 Petaling Jaya  
Selangor Darul Ehsan  
Malaysia  
e-mail: [kala.kuppusamy@ilinksoft.com](mailto:kala.kuppusamy@ilinksoft.com)